A1 cont'd

wherein the specific binding pair member is immobilized on a porous polymer, beads or on microstructures fabricated in the microchannel, and wherein the spatially separated defined regions each contain a specific binding pair member that is complementary to the analyte.

3. (Amended) The microfluidic device of claim 1 wherein the separated defined regions are porous polymer with a specific binding pair member bound to the porous polymer.

A2

4. (Amended) The microfluidic device of claim 1 wherein the separated defined regions have beads with a specific binding pair member bound to the beads.

5. (Amended) The microfluidic device of claim 1 wherein the defined regions [are] with immobilized binding pair members are formed by introducing hydrogels in the microchannels.

7. (Amended) The [defined region] microfluidic device of claim 5 wherein the hydrogels in the microchannels are patterned [by means including photolithography].

A3

8. (Amended) The microfluidic device of claim 1 wherein the separated defined regions have microstructures fabricated into the microchannel and the microstructures have a specific binding pair member bound thereto.

9. (Amended) The microfluidic device of claim 1 wherein the binding pair members are selected from [a] the group consisting of DNA, RNA, polypeptides, nucleic acids, [and antibody/antigens] antibodies and antigens.

10. (Amended) The microfluidic device of claim 1 wherein the specific binding pair member is a DNA or RNA probe.

11. (Amended) The microfluidic device of claim 1 wherein the specific binding pair member is DNA.

13. (Amended) The microfluidic device of claim 12 wherein the fluid propelling component [in claim 12] is a pressurized gas, vacuum, electrical field, magnetic field or centrifugal force.

14. (Amended) The microfluidic device of claim 1, further comprising a detector component that is operatively associated with the microchannels.

Please add new Claim 21:

New Claim 21. The microfluidic device of claim 7 wherein photolithography is used to pattern the hydrogels.